CONVERSION OF PLASTIC WASTE INTO FUEL

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Keywords:

Conversion of Plastic, Social Awareness, Best Out Of Waste.

Introduction:

Plastic were invented in 1860, but have only been widely used in the last 30 years plastic are light, durable modifiable and hygienic. Plastic are made of long chain of molecule called polymers. Polymers are made when naturally occurring substance such as crude oil or petroleum are transformed into other substance with completely different properties. These polymers can then be made into granules, powders and liquids, becoming raw materials for plastic products.

Plastics have become an indispensable part in today's world. Due to their light weight, durability, energy efficiency, coupled with faster rate of production and design flexibility, these plastics are used in entire gamut of industrial and domestic areas. Plastics are non-biodegradable polymers mostly containing carbon, hydrogen and few other elements like Nitrogen. Due to its non- biodegradable nature, the plastic waste contributes significantly to the problem of waste management. According notion wide survey which was conducted in the year 2000, approximately 6000 tons of plastic were generated in India and only 60 % of it was recycled, the balance of 40% could not to be disposed of. Today about 130 million tons of plastics are produced annually all over the world, out of which 77 million tons produced from petroleum products.

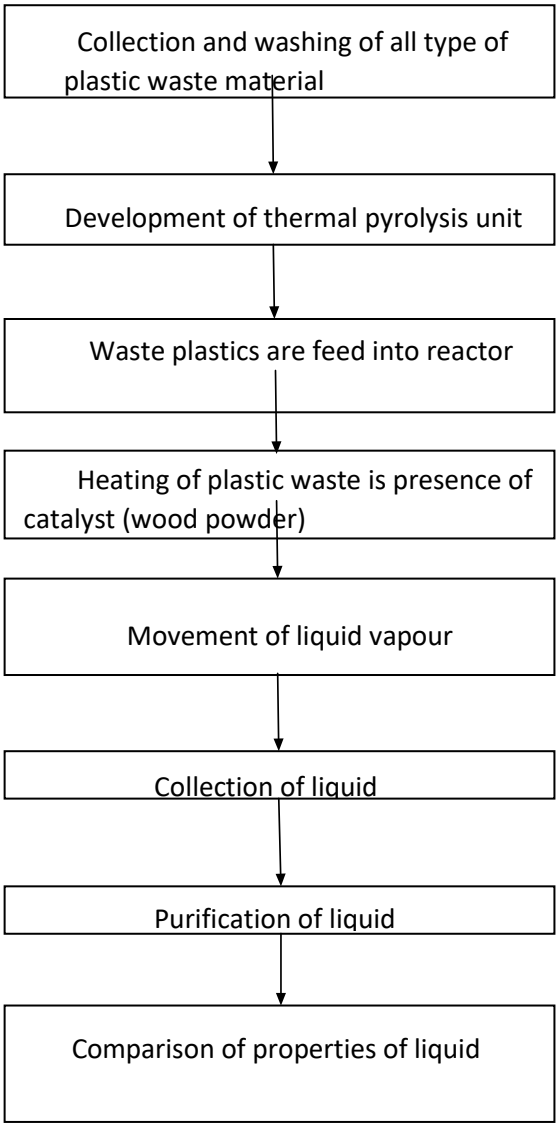
Objectives:

1. To collect the plastic waste material from different places.
2. Drying and storing of plastic waste.
3. Development of thermal pyrolysis unit.
4. Conversion of plastic waste into a liquid fuel.
5. To purify the produced liquid fuel by water washing method.
6. To conduct the different experiment to determine different properties of liquid fuels.

7. Compare the properties of liquid fuel with diesel fuel.

Methodology:

The above pyrolysis process contains various working steps like combustion chamber by using external fire with. The instrument contains mainly cylinders shell to fed with known amount of plastic waste material which is heated up to the liquid state as the temperature goes on increase continuously. State of liquid changes to vapour. This vapour is then passed with conical opening pipe from the upper end &gets condensed in the condenser & finally oil is collected in the flask. Thermocouples are used to check the temperatures at different locations. The produced hydrocarbon liquid fuel that can be used in IC Engine



Conclusion:

Very difficult to find out alternative of plastic. Even plastic´s demand is increasing every day as well as their waste. This project analysis has observed the use of waste plastics, a factory planning and its feasibility in Metropolitan City. It is easily assumed that, when the use of waste plastic will increase then the solid waste management will search more ways to find out to collect them.

The implementation of this project can develop so many opportunities in the city. It can be a solution to control waste plastic, develop a new technique or idea, and detect the source of diesel for the country. Bangladesh is such a country where this kind of project could be very promising and effective in the future.

The use of plastic liquid fuel in diesel engine in the aspect of technical and economical is compared and found that oil is able to replace the diesel oil. Though the plastic liquid fuel offers lower engine performance, the plastic waste amount is enormous and it needed to be process to reduce the environmental problems. Moreover, the engine can be modify follow the combustion condition of plastic pyrolysis oil.

As a result plastic liquid fuel obtained from developed pyrolysis unit is around 100-150 ml by per kg of plastic waste (wasted milk packets) compared to previous pyrolysis unit. more amount of plastic fuel is get by continues burn of wood & coal in the heating chamber and also by reduced height of the unit & from yield comparison chart we conclude that yield rate of oil is higher from developed thermal pyrolysis unit compare to previous pyrolysis unit.

Scope for future work:

1. The waste of plastic can be utilized effectively.
2. It can be used as an alternative fuel of petrol, by using this fuel in petrol engines, generators
3. It is useful for developing countries to increase their GDP rate.
4. The plastic waste can be utilized for generating fuel and the remaining waste can be used as a grease making it as multiproduct.
5. Generating cost of a fuel is less resulting more profit.
6. It can be used in a boiler for generating of a electricity.
7. Further research and development can improve the efficiency and plastic waste utilization.
8. Design and plan is easy for setting up an industry